MODIFICATION HISTORY

MODEL NAME : CPD-M151

SERVICE MANUAL

PARTS No. : 9-978-665-03

* Blue characters are linking.

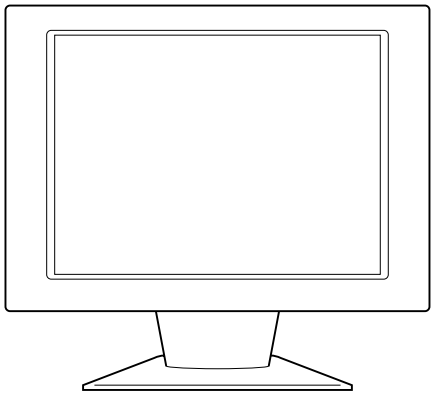
No.	DATA	CONTENTS
#1	2000. 3	Adds ten parts of exploded view owing to addition of the black model. (P.5-1, 24)
#2	2000.10	Supply of LAMP UNIT was changed. (P.5-1)
#3	2000.10	Parts number clerical error correction. (P.5-1)
#4	2000.10	Information label was added by change in place of production. [Made in Taiwan →Thailand] (P.5-1)
#5	2004. 2	Change the part number (No.52) of AC ADAPTOR in the expladed views. (P.24)

CPD-M151

SERVICE MANUAL

US Model
Canadian Model
AEP Model

Chassis No. SCC-G25H-A



SPECIFICATIONS

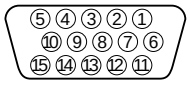
LCD panel	Panel type: a-Si TFT Active Matrix Picture size: 15 inches (38 cm)
Input signal format	RGB operating frequency* fh: 30 – 61 kHz fv: 50 – 75 Hz
Pixel efficiency	99.99 %
Resolution	H: max. 1024 dots V: max. 768 lines
Power requirements	Operation: AC 100 – 240 V, 50 – 60 Hz Input: DC 12 V (using the AC adapter)
Power consumption	Monitor only: Max. 25 W Including the AC adapter: Max. 35 W
Dimensions (w/h/d)	With the stand: Approx. 395 × 358 × 173 mm (15 5/8 × 14 1/8 × 6 7/8 in.) Without the stand (upright): Approx. 395 × 289 × 76 mm (15 5/8 × 11 1/2 × 3 in.) Without the stand (25° tilted): Approx. 395 × 274 × 202 mm (15 5/8 × 10 7/8 × 8 in.)
Mass	Approx. 5.1 kg (11 lb 4 oz) including the stand
Plug & Play	DDC/DDC1/DDC2B
Supplied accessories	• LCD monitor (1) • Rear cover (1) • Power cord (1) • AC adapter (1) • HD15 video signal cable (1) • Macintosh adapter (1) • Rubber pads (2) • Windows Monitor Information Disk/Utility Disk (1) • Macintosh Utility Disk (1) • Warranty card (1) • These operating instructions (1)

*** Recommended horizontal and vertical timing conditions**

Horizontal sync width duty should be more than 4.8% of total horizontal time or 0.8 µsec., whichever is larger.
Horizontal blanking width should be more than 2.5 µsec.
Vertical blanking width should be more than 450 µsec.

Design and specifications are subject to change without notice.

HD15 pin assignment



Pin No.	Signal	Pin No.	Signal
1	Red	8	Blue Ground
2	Green (Composite Sync on Green)	9	DDC + 5V*
		10	Ground
		11	ID (Ground)
3	Blue	12	Bi-Directional Data (SDA)*
4	ID (Ground)		
5	DDC Ground*	13	H. Sync
6	Red Ground	14	V. Sync
7	Green Ground	15	Data Clock (SCL)*

* Display Data Channel (DDC) Standard of VESA

TFT LCD COLOR COMPUTER DISPLAY

SONY®

MICROFILM

Power Saving Function

This monitor meets the power-saving guidelines set by VESA and ENERGY STAR, as well as the more stringent NUTEK .
If the monitor is connected to a computer or video graphics board that is VESA DPMS (Display Power Management Signaling) compliant, the monitor will automatically reduce power consumption in three stages as shown right.
You can set the delay time before the monitor enters the power saving mode using the OSD. Set the time according to "Setting the Power Saving Delay Time" on page 1-7.

* Power consumption of the monitor only. The figures in parentheses are power consumption of the monitor including the AC adapter.

** "Sleep" and "deep sleep" are power saving modes defined by the Environmental Protection Agency.

*** When your computer enters the power saving mode, the input signal is cut and NO INPUT SIGNAL appears on the screen. After the time set in "Changing the Power Saving Delay Time" (page 1-7) has elapsed, the monitor enters the power saving mode.

	Power consumption mode	Power consumption*	⏻ Indicator
1	Normal operation	≤ 25 W (≤ 35 W)	Green
2	Standby (1st mode)	≤ 1.5 W (≤ 4 W)	Green and orange alternate
3	Suspend (2nd mode) (sleep)**	≤ 1.5 W (≤ 4 W)	Green and orange alternate
4	Active-off (3rd mode)*** (deep sleep)**	≤ 1.5 W (≤ 4 W)	Orange
5	Power-off	≤ 1.5 W (≤ 4 W)	Off

TIMING SPECIFICATION

MODE AT PRODUCTION	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7	MODE 8	MODE 9	MODE 10	MODE 11
SIGNAL MODE	NEC (70Hz)	VGA (Graph)	VESA (75Hz)	VGA (TEXT)	VESA (60Hz)	VESA (75Hz)	PMAC 16"	VESA (60Hz)	VESA (70Hz)	VESA (75Hz)	PMAC 19"
RESOLUTION	640 X 400	640 X 480	640 X 480	720 X 400	800 X 600	800 X 600	832 X 624	1024 X 768	1024 X 768	1024 X 768	1024 X 768
CLOCK	25.180 MHz	25.175 MHz	31.500 MHz	28.322 MHz	40.000 MHz	49.500 MHz	57.285 MHz	65.000 MHz	75.000 MHz	78.750 MHz	80.000 MHz
— HORIZONTAL —											
H-FREQ	31.48 kHz	31.47 kHz	37.50 kHz	31.47 kHz	37.88 kHz	46.88 kHz	49.73 kHz	48.36 kHz	56.47 kHz	60.02 kHz	60.24 kHz
	usec	usec	usec	usec	usec	usec	usec	usec	usec	usec	usec
H. TOTAL	31.771	31.778	26.667	31.777	26.400	21.333	20.110	20.677	17.707	16.660	16.660
H. SYNC	2.542	3.813	2.032	3.813	3.200	1.616	1.117	2.092	1.813	1.219	1.200
H. BP	2.859	1.907	3.810	1.907	2.200	3.232	3.910	2.462	1.920	2.235	2.200
H. ACTIV	25.417	25.422	20.317	25.422	20.000	16.162	14.524	15.754	13.653	13.003	12.800
— VERTICAL —											
V. FREQ(Hz)	70.1 Hz	59.9 Hz	75.0 Hz	70.1 Hz	60.3 Hz	75.0 Hz	74.6 Hz	60.0 Hz	70.1 Hz	75.0 Hz	74.9 Hz
	lines	lines	lines	lines	lines	lines	lines	lines	lines	lines	lines
V. TOTAL	449	525	500	449	628	625	667	806	806	800	804
V. SYNC	2	2	3	2	4	3	3	6	6	3	3
V. BP	36	33	16	35	23	21	39	29	29	28	30
V. ACTIV	400	480	480	400	600	600	624	768	768	768	768
— SYNC —											
(H/V)/POLARITY	N/N	N/N	N/N	N/P	P/P	P/P	N/N	N/N	N/N	P/P	N/N

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
8. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC Leakage. Check leakage as described below.

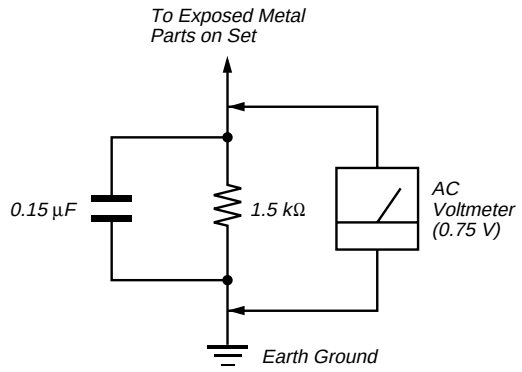


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers).

Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOMs that are suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

WARNING!!

NEVER TURN ON THE POWER IN A CONDITION IN WHICH THE DEGAUSS COIL HAS BEEN REMOVED.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL FOR SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

AVERTISSEMENT!!

NE JAMAIS METTRE SOUS TENSION QUAND LA BOBINE DE DEMAGNETISATION EST ENLEVÉE.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SONT CRITIQUES POUR LA SÉCURITÉ. NE LES REMPLACER QUE PAR UNE PIÈCE PORTANT LE NUMÉRO SPECIFIÉ. LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIÉS DANS LE PRÉSENT MANUEL. SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ.

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SECTION 1
GENERAL

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remein as in the manual.

Precautions

Installation

- Prevent internal heat buildup by allowing adequate air circulation. Do not place the monitor on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation holes.
- Do not install the monitor near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not place the monitor near equipment which generates magnetism, such as a transformer or high voltage power lines.

Handling the LCD screen

- **Bright points of light (red, blue or green) may appear on the LCD screen. This is not a malfunction. The LCD screen is made with high-precision technology and more than 99.99 % of the picture element is intact. However, some of the picture element may not appear or some of the picture element may appear constantly.**
- Do not leave the LCD screen facing the sun as it can damage the LCD screen. Take care when you place the monitor by a window.
- Do not push or scratch the LCD screen. Do not place a heavy object on the LCD screen. This may cause the screen to lose uniformity.
- If the monitor is used in a cold place, a residual image may appear on the screen. This is not a malfunction. When the monitor becomes warm, the screen returns to normal.
- If a still picture is displayed for a long time, a residual image may appear. The residual image will eventually disappear.
- The screen and the cabinet become warm during operation. This is not a malfunction.

Replacement of the fluorescent tube

A specially designed fluorescent tube is installed as the lighting apparatus for this monitor. If the LCD screen becomes dark, unstable or does not turn on, replace the fluorescent tube with an new one. Consult your Sony dealer when replacing the fluorescent tube.

Maintenance

- Clean the cabinet, panel and controls with a soft cloth lightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent, such as alcohol or benzine.
- Do not rub, touch, or tap the surface of the screen with sharp or abrasive items such as a ballpoint pen or screwdriver. This type of contact may result in a scratched picture tube.
- Clean the screen with a soft cloth. If you use a glass cleaning liquid, do not use any type of cleaner containing an antistatic solution or similar additive as this may scratch the screen's coating.

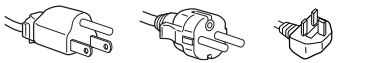
Transportation

- When you transport this monitor, grip the bottom of the screen firmly with both hands. If you drop the monitor, you may be injured or the monitor may be damaged.
- When you transport this monitor for repair or shipment, use the original carton and packing materials.

Warning on power connection

- Use an appropriate power cord for your local power supply.
  For the customers in the U.S.A.
  If you do not use the appropriate cord, this monitor will not conform to mandatory FCC standards.
  For the customers in the UK
  If you use the monitor in the UK, please use the supplied UK cable with the UK plug.

Examples of plug types



for 100 to 120 V AC **for 200 to 240 V AC** **for 240 V AC only**

The outlet should be installed near the equipment and be easily accessible.

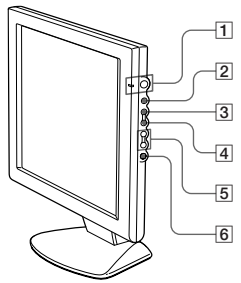
Disposal of the monitor

- **Do not dispose of the monitor with general waste.** Do not include the monitor with household waste.
- **The fluorescent tube includes mercury. Dispose of the monitor in accordance with the regulations of your local sanitation authority.**

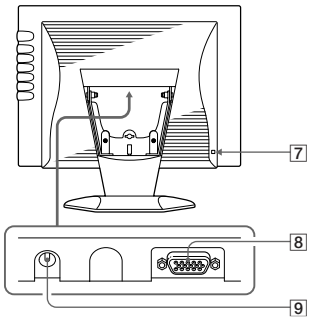
Identifying Parts and Controls

See the pages in parentheses for further details.

Front



Rear



1 ⏻ **(power) switch and indicator (pages 10, 20)**
Turns the monitor on or off.
The indicator lights up in green when the monitor is turned on, and either flashes in green and orange or lights up in orange when the monitor is in power saving mode.

2 **MENU (menu) button (pages 11 – 17, 20)**
Displays the MENU OSD (On-Screen Display).

3 ☼ **(brightness) (⇧) button (pages 11 – 17)**
Adjusts the picture brightness.

Functions as the ⇧ button when selecting menu items.

4 ◑ **(contrast) (⇩) button (pages 11 – 17)**
Adjusts the contrast.

Functions as the ⇩ button when selecting menu items.

5 **+/– (adjust) buttons (pages 13 – 17)**
Adjusts the selected menu item.

6 **AUTO button (page 12)**
When the signal from the computer is displayed on this monitor, press the AUTO button to automatically adjust the picture to the computer.
You also should press this button if the picture is not centered or if it is fuzzy.

7 **Security lock (🔒)**
You can attach the Kensington's security cable (not supplied).

8 **RGB input connector (HD15) (page 7)**
Input analog RGB video signal (0.714 Vp-p, positive) and SYNC signal.

9 **DC IN connector (page 7)**
Provides DC power to the monitor from the AC adaptor.

GB

Setup

Before using this monitor, check that the following items are included in your carton:

- LCD monitor (1)
- Rear cover (1)
- Power cord (1)
- AC adapter (1)
- HD15 video signal cable (1)
- Macintosh adapter (1)
- Rubber pads (2)
- Windows Monitor Information Disk/Utility Disk (1)
- Macintosh Utility Disk (1)
- Warranty card (1)
- These operating instructions (1)

Set up

You can set up the monitor on its stand or use it without the stand. The procedure of connecting cables and attaching the rear cover differs depending on how you set up the monitor. In either case, read:

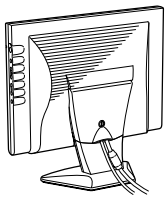
Step 1: Connect the monitor to the computer

Step 2: Connect the power cord

to connect the monitor to the computer and power source. The connection is explained using the stand-type set up for the illustration; however, the connector to be connected and adapter required are the same even when the stand is not used.

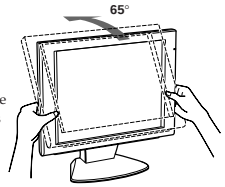
Stand set up

Connect the video signal cable and power cord, then attach the rear cover.



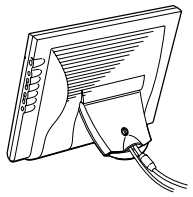
To adjust the angle

The tilt feature allows the monitor to be adjusted within 65° upward. To adjust the angle, hold at the bottom with both hands as illustrated.



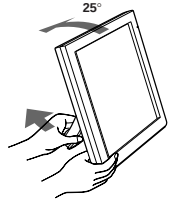
Set up without the stand

First detach the stand, and then connect the video signal cable and power cord. Attach the rear cover. The rear cover becomes the stand. See "Using the monitor without the stand" on page 8.



To adjust the angle

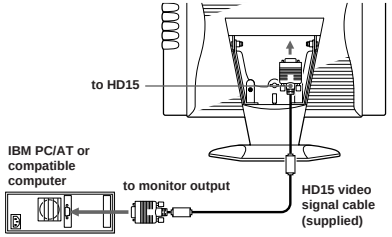
The tilt feature allows the monitorto be adjusted within 25° upward. To adjust the angle, hold at the bottom and open the stand as illustrated.



Step 1: Connect the monitor to the computer

Turn off the monitor and computer before connecting.

Connecting to an IBM PC/AT or compatible computer



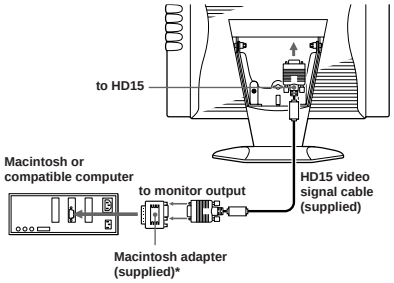
If your PC system is not compatible with Plug & Play (DDC1 and DDC2B)

This monitor uses the No. 9 pin in the video signal connector for Plug & Play (DDC1 and DDC2B) compatibility. See page 21 for the location of the No. 9 pin.

- If your computer accepts the No. 9 pin, use the supplied HD15 video signal cable.
- If your computer does not accept the No. 9 pin, please consult your dealer for advice on obtaining an HD15 adapter.

Connecting to a Macintosh

Use the supplied Macintosh adapter.

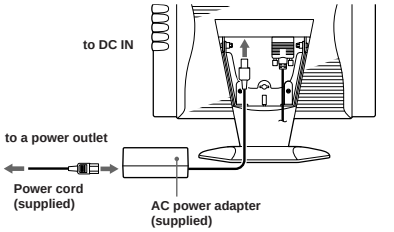


* Connect the supplied Macintosh adapter to the computer before connecting the cable. This adapter is compatible with Macintosh LC, Performa, Quadra, Power Macintosh and Power Macintosh G3 series computers (sold before January, 1999). If you are connecting to a Power Macintosh G3 series that sold after January 1999, you will need a different adapter (not supplied). Macintosh II series and some older versions of PowerBook models may need an adapter with micro switches (not supplied).

GB

Step 2: Connect the power cord

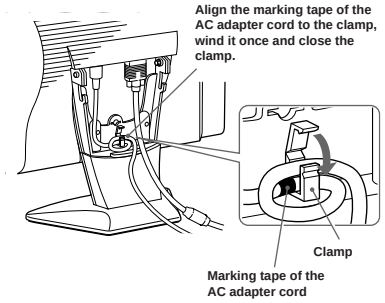
With the monitor and computer switched off, connect one end of the power cord to the AC power adapter, and the AC power adaptor to the monitor. Then connect the other end o the power cord to a power outlet.



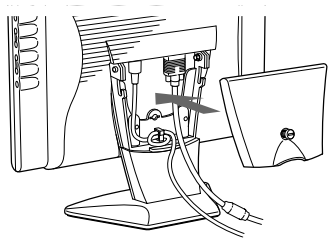
Step 3: Attaching the rear cover

After connecting the computer and power cord, attach the supplied rear cover.
Make sure that you keep the screen upright when attaching or detaching the rear cover.

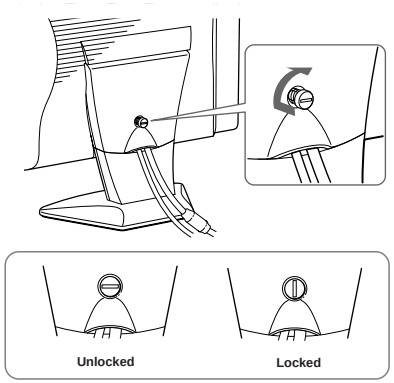
1 **Clamp the AC adapter cord.**


Align the marking tape of the AC adapter cord to the clamp, wind it once and close the clamp.
Clamp
Marking tape of the AC adapter cord

2 **Press the rear cover against the part for attaching the cover.**



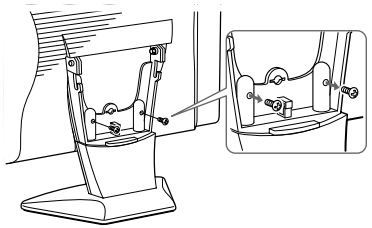
3 **Turn the screw to fasten the rear cover.**



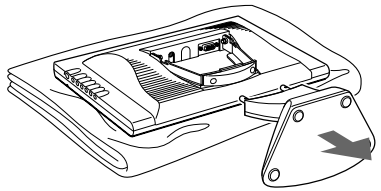
Using the monitor without the stand

Prepare:
Philip's screw driver
Soft cloth to place under the LCD panel

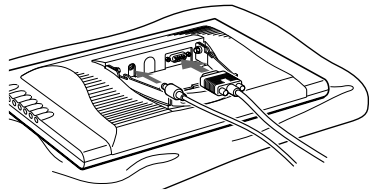
1 **Remove the screws from the fixing shaft of the stand.**



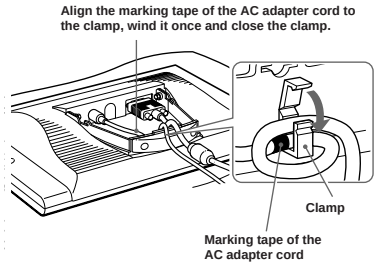
2 **Place the monitor on the soft cloth with the LCD panel facing down, and pull the stand out from the monitor.**



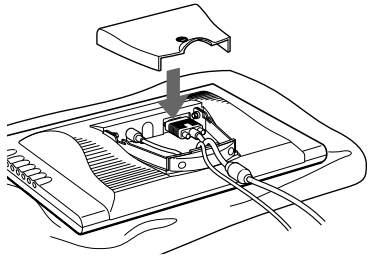
3 **Connect the video signal cable and AC adapter cord to the monitor.**



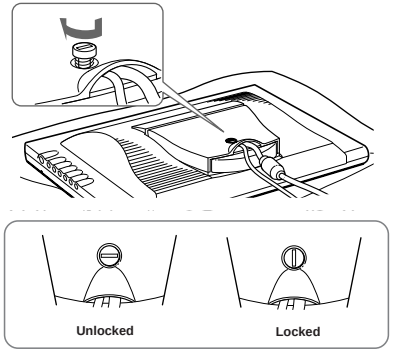
4 **Clamp the AC adapter cord.**


Align the marking tape of the AC adapter cord to the clamp, wind it once and close the clamp.
Clamp
Marking tape of the AC adapter cord

5 **Press the rear cover against the part for attaching the cover.**

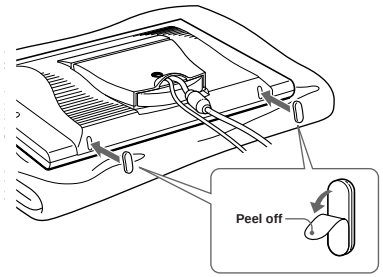


6 **Turn the screw to fasten the rear cover.**



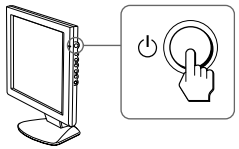
GB

7 **Attach the rubber pads to the bottom of the monitor.**
After attaching the rubberpads, which prevent slipping, stand the monitor up.



Turning on the Monitor and Computer

1 Press the ⏻ (POWER) switch.



2 Turn on the computer.

The installation of your monitor is complete.
If necessary, use the monitor's controls to adjust the picture.

If no picture appears on your screen

- Check that the monitor is correctly connected to the computer.
- If NO INPUT SIGNAL appears on the screen, try changing the input signal, and confirm that your computer's graphics board is completely seated in the correct bus slot.
- If you are replacing an old monitor with this model and OUT OF SCAN RANGE appears on the screen, reconnect the old monitor. Then adjust the computer's graphics board so that the horizontal frequency is between 30 – 61 kHz, the vertical frequency is between 50 – 75 Hz, and the resolution is 1024 x 768 or lower.

For more information about the on-screen messages, see "Trouble symptoms and remedies" on page 19.

For customers using Windows 95/98

To maximize the potential of your monitor, install the new model information file from the supplied Windows Monitor Information Disk/Utility Disk onto your PC.
This monitor complies with the "VESA DDC" Plug & Play standard. If your PC/graphics board complies with DDC, select "Plug & Play Monitor (VESA DDC)" or this monitor's model name as the monitor type in the "Control Panel" of Windows 95/98. If your PC/graphics board has difficulty communicating with this monitor, load the Windows Monitor Information Disk/Utility Disk and select this monitor's model name as the monitor type.

For customers using Windows NT4.0

Monitor setup in Windows NT4.0 is different from Windows 95/98 and does not involve the selection of monitor type. Refer to the Windows NT4.0 instruction manual for further details on adjusting the resolution, refresh rate, and number of colors.

Adjusting the monitor's resolution and color number

Adjust the monitor's resolution and color number by referring to your computer's instruction manual. The color number may vary according to your computer or graphics board. The color palette setting and the actual number of colors are as follows:

- High color (16 bit) → 65,536 colors.
- True Color (24 bit) → about 16.77 million colors

In true color mode (24 bit), speed may be slower.

Before adjusting
Connect the monitor and the computer, and turn them on.
Wait for at least 30 minutes before making adjustments for the best result.

Introducing the On-Screen Display System

Most adjustments are made using the MENU OSD.
To change the on-screen display language, see "Selecting the On-Screen Display Language."

EXIT
Closes the MENU OSD.

PHASE
Displays the PHASE OSD. Adjust the phase when the characters or pictures appear fuzzy throughout the entire screen. Adjust the phase after adjusting the pitch.

PITCH
Displays the PITCH OSD. Adjust the pitch when the characters or pictures are not clear at some parts of the screen.

CENTER
Displays the CENTER OSD for adjusting the centering of the picture.

COLOR
Displays the COLOR OSD for adjusting the color temperature.

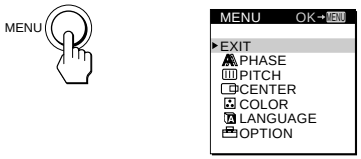
LANGUAGE
Displays the LANGUAGE OSD for selecting the on-screen display language.

OPTION
Displays the OPTION OSD. You can adjust settings such as the backlight, OSD position, power saving delay time and control lock.

Selecting the On-Screen Display Language

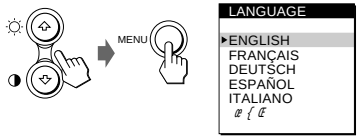
You can select the OSD language from English, French, German, Spanish, Italian, and Japanese.

1 Press the MENU button.
The MENU OSD appears.

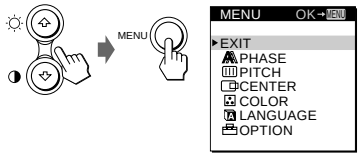


GB

2 Press the ⇧/⇩ buttons to select LANGUAGE, and press the MENU button.
The LANGUAGE OSD appears.



3 Press the ⇧/⇩ buttons to select the desired language, and press the MENU button.
The MENU OSD of the selected language appears.



The OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button again.

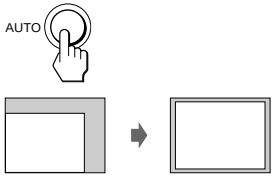
Automatically Adjusting the Picture

If the picture is flickering or fuzzy, press the AUTO button. The monitor is automatically adjusted to match the signal from the connected computer.
Further fine adjustments may be needed with some computers. In this case, manually adjust the monitor.

1 Turn on the monitor.

2 Turn on the computer.

3 Press the AUTO button.
The monitor adjusts the pitch to match the input signal so that the picture appears sharp, and fits the picture to the center of the screen.



Notes

- This function is intended for use with a computer running Windows or similar graphic user interface software that provides a full-screen picture. It may not work properly if the background color is dark or if the input picture does not fill the screen to the edges (such as an MS-DOS prompt). In this case, do steps 1 to 3 of "Eliminating Flickering or Blurring Manually" to display the test pattern, then press the AUTO button again.
- The screen may go blank for a few seconds while performing the auto-sizing function. This is not a malfunction.

If the picture is flickering or fuzzy even after you press the AUTO button

Adjust the Pitch and Phase by referring to "Eliminating Flickering or Blurring Manually."

If the picture is not in the center of the screen even after you press the AUTO button

Adjust using the CENTER OSD by referring to "Adjusting the Picture Position."

Eliminating Flickering or Blurring Manually

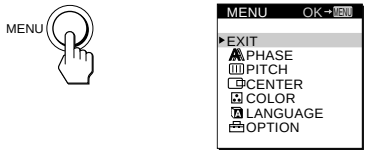
If a part of the screen is flickering or blurring, press the AUTO button. If this operation does not work, adjust the Pitch and Phase as follows.
Once the pitch and phase are adjusted, they will be stored in memory for the current input signal.

1 Set the resolution to 1024 × 768 on the computer.

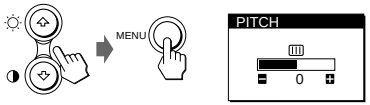
2 Load the Utility Disk.
Use the appropriate disk for your computer.
For Windows 95/98
Windows Monitor Information Disk/Utility Disk
For Macintosh
Macintosh Utility Disk

3 Start the Utility Disk and display the test pattern.
For Windows 95/98
Click [Utility Disk] → [Windows] → [Utility.exe].
For Macintosh
Click [Utility Disk] → [SONY-Utility].

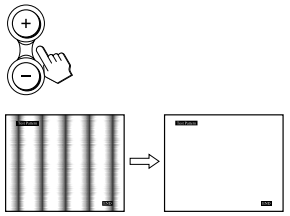
4 Press the MENU button.
The MENU OSD appears.



5 Press the ⇧/⇩ buttons to select PITCH, and press the MENU button again.
The PITCH OSD appears.

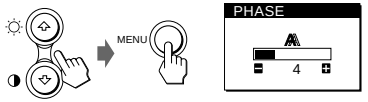


6 Press the +/– buttons until the screen color becomes uniform.
Adjust so that the vertical stripes disappear.

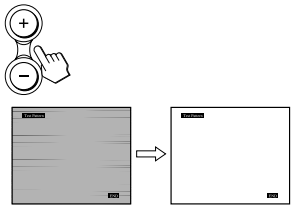


7 Press the MENU button.
The MENU OSD appears.
If horizontal stripes are observed over the entire screen, adjust the Phase in the next step.

8 Press the ⇧/⇩ buttons to select PHASE, and press the MENU button again.
The PHASE OSD appears.



9 Press the +/– buttons until the screen color becomes uniform.
Adjust until the horizontal stripes are at a minimum.



10 When you have finished, click END on the screen to turn off the test pattern.

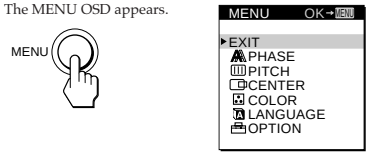
The OSD automatically disappears after about 30 seconds. To close the OSD, press the MENU button twice.

Adjusting the Picture Position

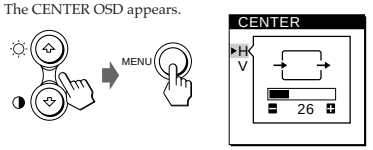
If the picture is not in the center of the screen, press the AUTO button. If this operation does not work, adjust the centering as follows.
Once the centering is adjusted, it will be stored in memory for the current input signal.

1 Start the Utility Disk and display the test pattern.
Do steps 2 and 3 of "Eliminating Flickering or Blurring Manually."

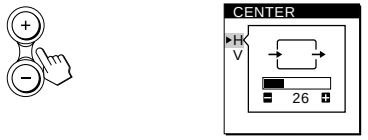
2 Press the MENU button.
The MENU OSD appears.



3 Press the ⇧/⇩ buttons to select CENTER, and press the MENU button again.
The CENTER OSD appears.

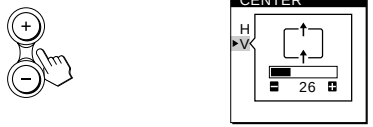


4 Move the picture up, down, left, or right until the frame at the perimeter of the test pattern disappears.
For horizontal adjustment, select H using the ⇧/⇩ buttons and adjust the position using the +/– buttons.
+ . . . to move the picture right
– . . . to move the picture left



Continued

For vertical adjustment, select V using the ⇧/⇩ buttons and adjust the position using the +/– buttons.
+ . . . to move the picture up
– . . . to move the picture down



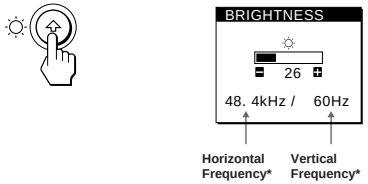
5 When you have finished, click END on the screen to turn off the test pattern.

The OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

Adjusting the Picture Brightness

Once the brightness is adjusted, it will be stored in memory for all input signals received.

1 Press the ☼ (brightness) ⇧ button.
The BRIGHTNESS OSD appears.



2 Press the +/– buttons.

+ . . . for more brightness
– . . . for less brightness

The OSD automatically disappears after about 3 seconds.

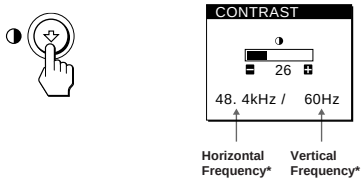
* The horizontal and vertical frequencies for the received input signal appear in the BRIGHTNESS OSD.

If the screen is too bright when using the monitor in a dark room
Decrease the BACKLIGHT (page 16).

Adjusting the Contrast

Once the contrast is adjusted, it will be stored in memory for all input signals received.

1 Press the ◑ (contrast) ⇩ button.
The CONTRAST OSD appears.



2 Press the +/– buttons.

+. . . for more contrast
–. . . for less contrast

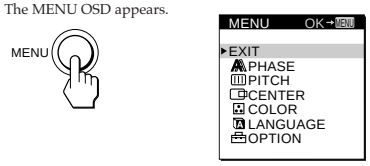
The OSD automatically disappears after about 3 seconds.

* The horizontal and vertical frequencies for the received input signal appear in the CONTRAST OSD.

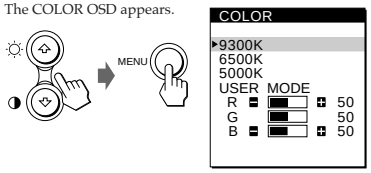
Changing or Adjusting the Color Temperature

The color temperature is set to 9300K at the factory.
You can change the color temperature to 6500K or 5000K.
Use this function to adjust the color temperature so that it matches the actual colors of a printed picture.
Once the color temperature is adjusted, it will be stored in memory for all input signals received.

1 Press the MENU button.
The MENU OSD appears.

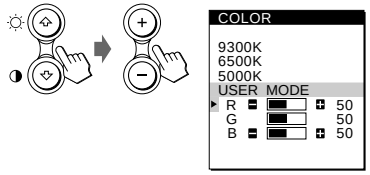


2 Press the ⇧/⇩ buttons to select COLOR, and press the MENU button again.
The COLOR OSD appears.



3 Press the ⇧/⇩ buttons to select the color temperature.
If you need to make further adjustments to the selected color temperature, go to step 4.
If you don't, press the MENU button. The MENU OSD appears.

4 Press the ⇧/⇩ buttons to select R (red) or B (blue), and press the +/– buttons to get the desired color.
The color changes as the R or B components increase or decrease with respect to G (green).

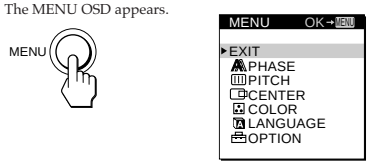


The OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

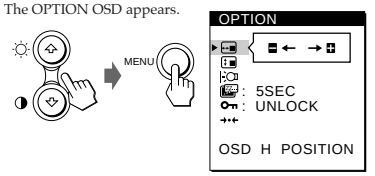
Changing the On-Screen Display Position

You can change the OSD position (for example, when you want to adjust the picture behind the OSD).

1 Press the MENU button.
The MENU OSD appears.



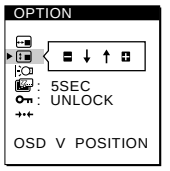
2 Press the ⇧/⇩ buttons to select OPTION, and press the MENU button again.
The OPTION OSD appears.



3 Press the ⇧/⇩ buttons to select (OSD H POSITION) or (OSD V POSITION).

To adjust the horizontal position

To adjust the vertical position



4 Press the +/– buttons to move the OSD to the desired position.

The OPTION OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

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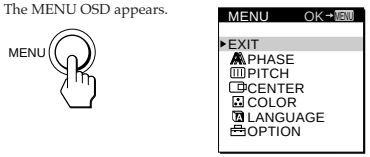
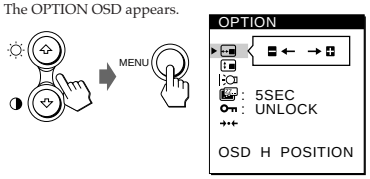
Adjusting the Backlight

If the screen is too bright when you are using the monitor in a dark room, adjust the backlight.

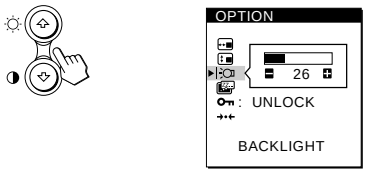
1 Press the MENU button.
The MENU OSD appears.



2 Press the ⇧/⇩ buttons to select OPTION, and press the MENU button again.
The OPTION OSD appears.



3 Press the ⇧/⇩ buttons to select (BACKLIGHT).



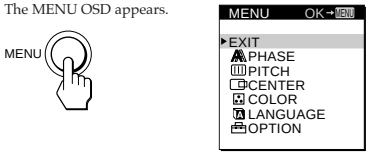
4 Press the +/– buttons to adjust the light level.

The OPTION OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

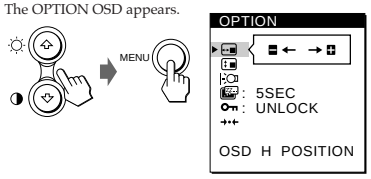
Setting the Power Saving Delay Time

You can set the delay time before the monitor enters the power saving mode. See page 18 for more information on this monitor's power saving capabilities.

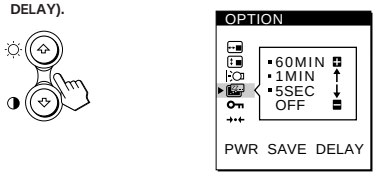
1 Press the MENU button.
The MENU OSD appears.



2 Press the ⇧/⇩ buttons to select OPTION, and press the MENU button again.
The OPTION OSD appears.



3 Press the ⇧/⇩ buttons to select (PWR SAVE DELAY).



4 Press the +/– buttons to select the desired time.

When PWR SAVE DELAY is set to OFF, the monitor does not go into power saving mode.

The OPTION OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

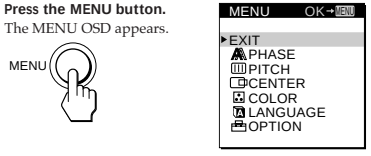
Locking the Controls

The control lock function disables all of the controls except the ⏻ (power) switch, MENU and some other buttons.

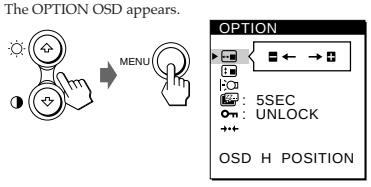
Once you select "LOCK," you can select only the following items in the MENU OSD:
- EXIT
- CONTROL LOCK and FACTORY PRESET in the OPTION OSD

If you press any locked button, the mark appears on the screen.

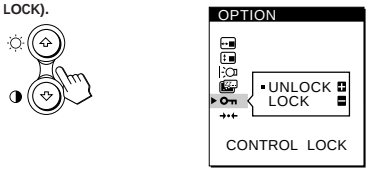
1 Press the MENU button.
The MENU OSD appears.



2 Press the ⇧/⇩ buttons to select OPTION, and press the MENU button again.
The OPTION OSD appears.



3 Press the ⇧/⇩ buttons to select (CONTROL LOCK).



4 Press the – button to select LOCK.

The OPTION OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

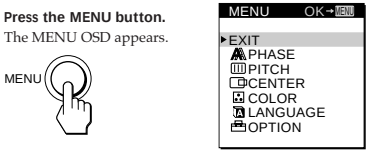
To cancel the control lock

Press the + button in step 4 to select UNLOCK.

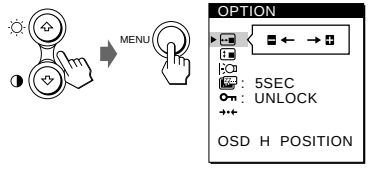
Resetting the Adjustments

You can reset all of the adjustments and settings to the factory settings.
The color temperature is reset to 9300K and the power saving delay time is reset to 5 seconds. The control lock is cancelled. All other adjustments return to the default settings. The on-screen language, however, does not change.

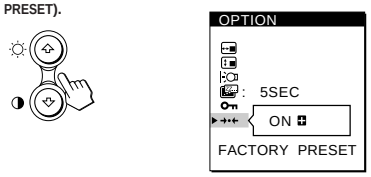
1 Press the MENU button.
The MENU OSD appears.



2 Press the ⇧/⇩ buttons to select OPTION, and press the MENU button again.
The OPTION OSD appears.



3 Press the ⇧/⇩ buttons to select (FACTORY PRESET).



4 Press the + button.

The OPTION OSD automatically disappears after about 30 seconds.
To close the OSD, press the MENU button twice.

GB

Preset and User Modes

This monitor has factory preset modes for the most popular industry standards for true "plug and play" compatibility. (See Appendix for a list of the factory preset modes.)
When a new input signal is entered, the monitor selects the appropriate factory preset mode and momentarily adjusts the phase calibration to provide a high quality picture to the center of the screen. The calibration is stored in memory and is immediately recalled whenever the same input signal is received.
For input signals that do not match one of the factory preset modes, the digital Multiscan technology of this monitor performs all of the adjustments necessary to ensure that a clear picture appears on the screen for any timing in the monitor's frequency range. However, it may be necessary to fine tune the vertical/horizontal centering. Simply press the AUTO button or adjust the monitor according to the adjustment instructions. The adjustments are stored automatically as a user mode and recalled whenever the corresponding input signal is received.

Power Saving Function

This monitor meets the power-saving guidelines set by VESA and ENERGY STAR, as well as the more stringent NUTEK .
If the monitor is connected to a computer or video graphics board that is VESA DPMS (Display Power Management Signaling) compliant, the monitor will automatically reduce power consumption in three stages as shown below.
You can set the delay time before the monitor enters the power saving mode using the OSD. Set the time according to "Setting the Power Saving Delay Time" on page 16.

	Power consumption mode	Power consumption*	⏻ Indicator
1	Normal operation	≤ 25 W (≤ 35 W)	Green
2	Standby (1st mode)	≤ 1.5 W (≤ 4 W)	Green and orange alternate
3	Suspend (2nd mode) (sleep)**	≤ 1.5 W (≤ 4 W)	Green and orange alternate
4	Active-off (3rd mode)*** (deep sleep)**	≤ 1.5 W (≤ 4 W)	Orange
5	Power-off	≤ 1.5 W (≤ 4 W)	Off

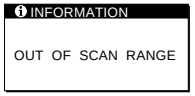
* Power consumption of the monitor only. The figures in parentheses are power consumption of the monitor including the AC adapter.
** "Sleep" and "deep sleep" are power saving modes defined by the Environmental Protection Agency.
*** When your computer enters the power saving mode, the input signal is cut and NO INPUT SIGNAL appears on the screen. After the time set in "Changing the Power Saving Delay Time" (page 16) has elapsed, the monitor enters the power saving mode.

Troubleshooting

This section may help you isolate the cause of a problem and as a result, eliminate the need to contact technical support.

On-screen messages

If there is something wrong with the input signal, one of the following messages appears on the screen. To solve the problem, see "Trouble symptoms and remedies" on page 19.



"OUT OF SCAN RANGE" indicates that the input signal is not supported by the monitor's specifications.

"NO INPUT SIGNAL" indicates that no signal is input to the monitor.

Trouble symptoms and remedies

If the problem is caused by the connected computer or other equipment, please refer to the connected equipment's instruction manual.
Use the self-diagnosis function (page 20) if the following recommendations do no resolve the problem.

Symptom	Check these items
No picture	
If the ⏻ indicator is not lit	• Check that the power cord is properly connected. • Check that the ⏻ (power) switch is in the "on" position.
If the "NO INPUT SIGNAL" message appears on the screen, or if the ⏻ indicator is either orange or alternating between green and orange	• Check that the video signal cable is properly connected and all plugs are firmly seated in their sockets. • Check that the HD15 video input connector's pins are not bent or pushed in. ■ **Problems caused by the connected computer or other equipment** • The computer is in power saving mode. Try pressing any key on the computer keyboard. • Check that the computer's power is "on." • Check that your graphics board is completely seated in the proper bus slot.
If the "OUT OF SCAN RANGE" message appears on the screen	■ **Problems caused by the connected computer or other equipment** • Check that the video frequency range is within that specified for the monitor. If you replaced an old monitor with this monitor, reconnect the old monitor and adjust the frequency range to the following. Horizontal: 30 – 61 kHz, Vertical: 50 – 75 Hz
If no message is displayed and the ⏻ indicator is green or flashing orange	• Use the self-diagnosis function (page 20).
If using Windows 95/98	• If you replaced an old monitor with this monitor, reconnect the old monitor and do the following. Install the Windows Monitor Information Disk/Utility Disk and select "CPD-M151" from among the Sony monitors in the Windows 95/98 monitor selection screen.
If using a Macintosh system	• Check that the Macintosh adapter and the video signal cable are properly connected (page 6).
Picture flickers, bounces, oscillates, or is scrambled.	• Press the AUTO button. If this does not work, adjust the pitch and phase (page 12). • Isolate and eliminate any potential sources of electric or magnetic fields such as other monitors, laser printers, electric fans, fluorescent lighting, or televisions. • Move the monitor away from power lines or place a magnetic shield near the monitor. • Try plugging the monitor into a different AC outlet, preferably on a different circuit. • Try turning the monitor 90° to the left or right. ■ **Problems caused by the connected computer or other equipment** • Check your graphics board manual for the proper monitor setting. • Confirm that the graphics mode (VESA, Macintosh 19" Color, etc.) and the frequency of the input signal are supported by this monitor (Appendix). Even if the frequency is within the proper range, some graphics boards may have a sync pulse that is too narrow for the monitor to sync correctly. • Adjust the computer's refresh rate (vertical frequency) to obtain the best possible picture.
Picture is fuzzy.	• Press the AUTO button. If this does not work, adjust the pitch and phase (page 12). • Adjust the contrast and brightness (page 14).
Picture is dark.	• Adjust the backlight (page 16) • Adjust the brightness (page 14). • It takes several seconds for the monitor to warm up after the power is turned on. The picture will appear momentarily.

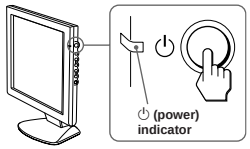
Continued

Additional Information

Symptom	Check these items
Picture appears to be ghosting.	• Eliminate the use of video cable extensions and/or video switch boxes. • Check that all plugs are firmly seated in their sockets.
Picture is not centered or sized properly.	• Press the AUTO button (page 12). • Adjust the centering (page 13). Note that some video modes do not fill the screen to the edges.
Wavy or elliptical (moire) pattern is visible.	• Adjust the pitch and phase (page 12).
Color is not uniform.	• Press the AUTO button. If this does not work, adjust the pitch and phase (page 12).
White does not look white.	• Adjust the color temperature (page 14).
Monitor buttons do not operate.	• If the control lock is set to LOCK, set it to UNLOCK (page 17).

Self-diagnosis function

This monitor is equipped with a self-diagnosis function. If there is a problem with your monitor or computer, the screen will go blank and the ⏻ (power) indicator will either light up green or flash orange. If the ⏻ (power) indicator is lit in orange, the computer is in power saving mode. Try pressing any key on the keyboard.



If the ⏻ (power) indicator is green

1 Disconnect the video signal cable.

2 Before the monitor goes to power saving mode, press the + button and keep it pressed for 2 seconds.

If all four color bars appear (white, red, green, blue), the monitor is working properly. Reconnect the video signal cable and check the condition of your computer.

If the color bars do not appear, there is a potential monitor failure. Inform your authorized Sony dealer of the monitor's condition.

If the ⏻ (power) indicator is flashing orange

Press the ⏻ (power) button to turn the monitor off and on.
If the ⏻ (power) indicator lights up green, the monitor is working properly.

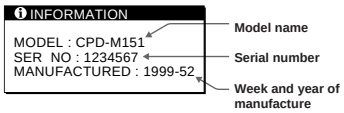
If the ⏻ (power) indicator is still flashing, there is a potential monitor failure. Count the number of seconds between orange flashes of the ⏻ (power) indicator and inform your authorized Sony dealer of the monitor's condition. Be sure to note the model name and serial number of your monitor. Also note the make and model of your computer and graphics board.

Displaying the INFORMATION OSD

You can confirm the name, the serial number and the year of manufacture of this monitor.

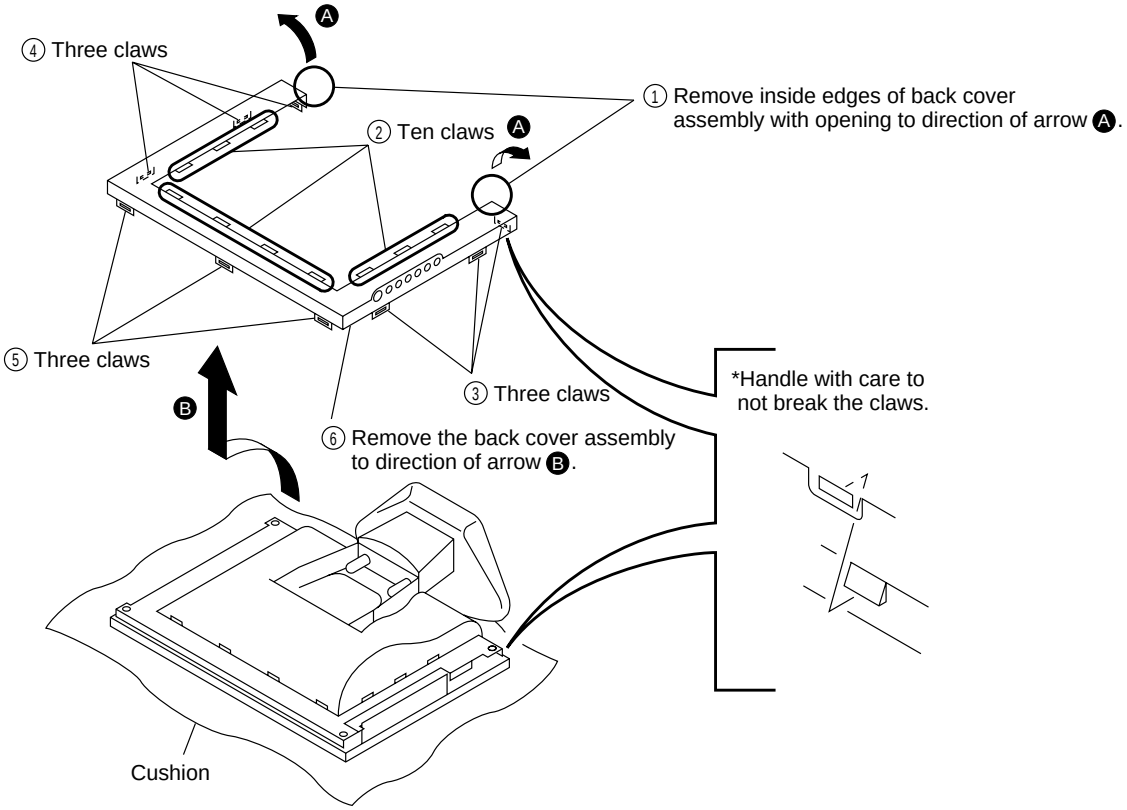
Press and hold the MENU button for 5 seconds.
The INFORMATION OSD appears.

Example

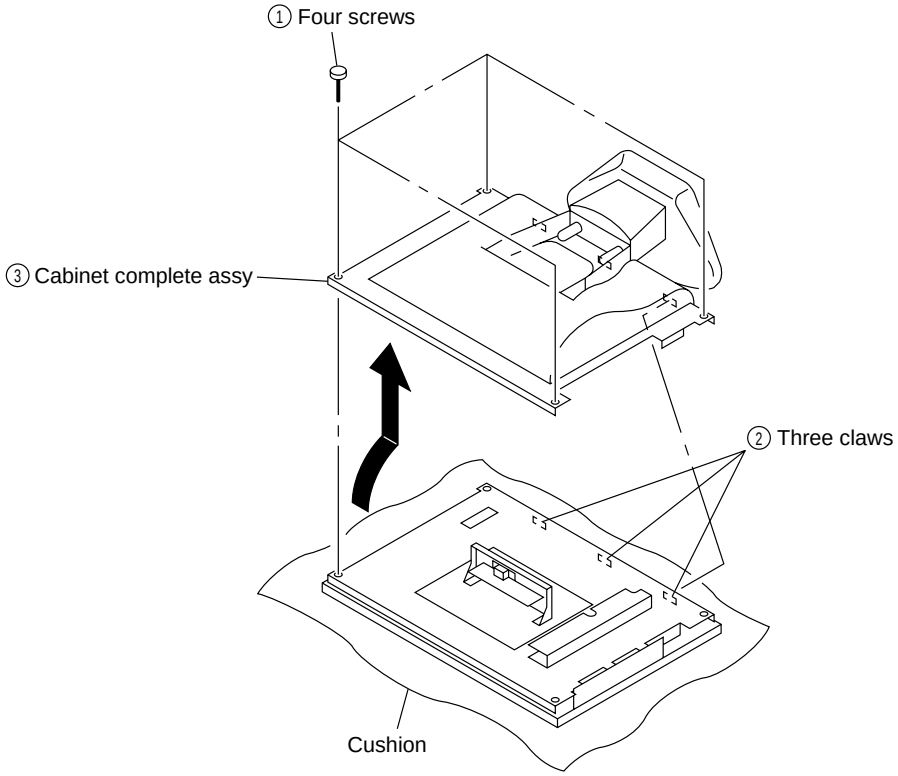


SECTION 2
DISASSEMBLY

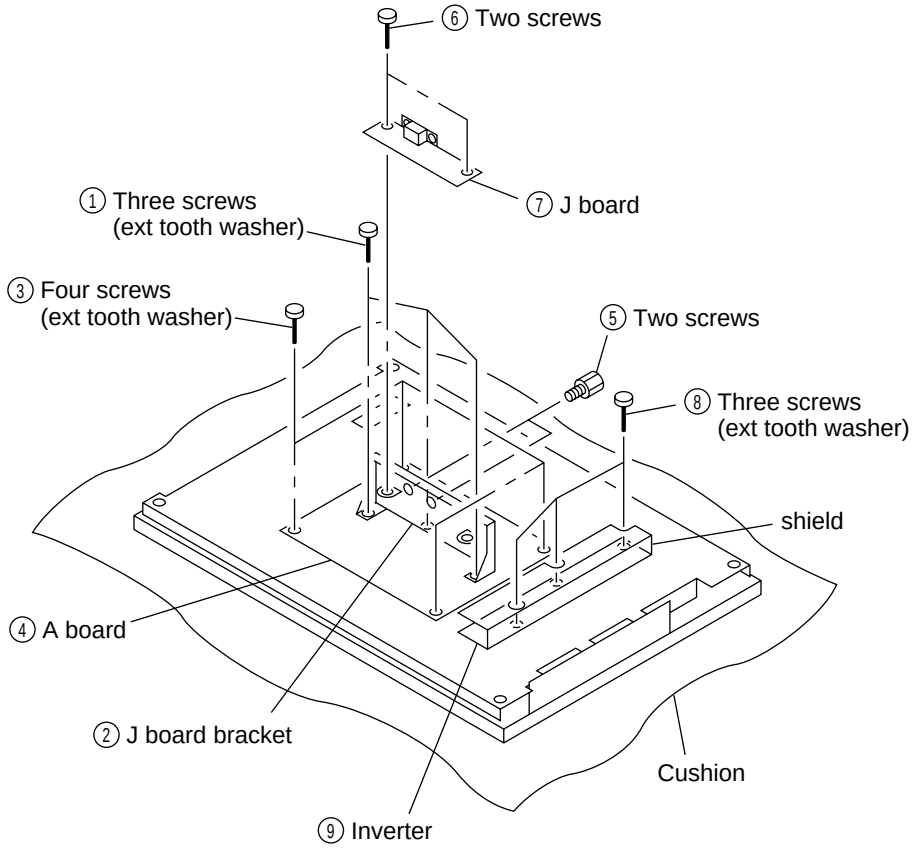
2-1. BACK COVER ASSY REMOVAL


④ Three claws
A
① Remove inside edges of back cover assembly with opening to direction of arrow A.
② Ten claws
A
⑤ Three claws
B
③ Three claws
*Handle with care to not break the claws.
⑥ Remove the back cover assembly to direction of arrow B.
Cushion

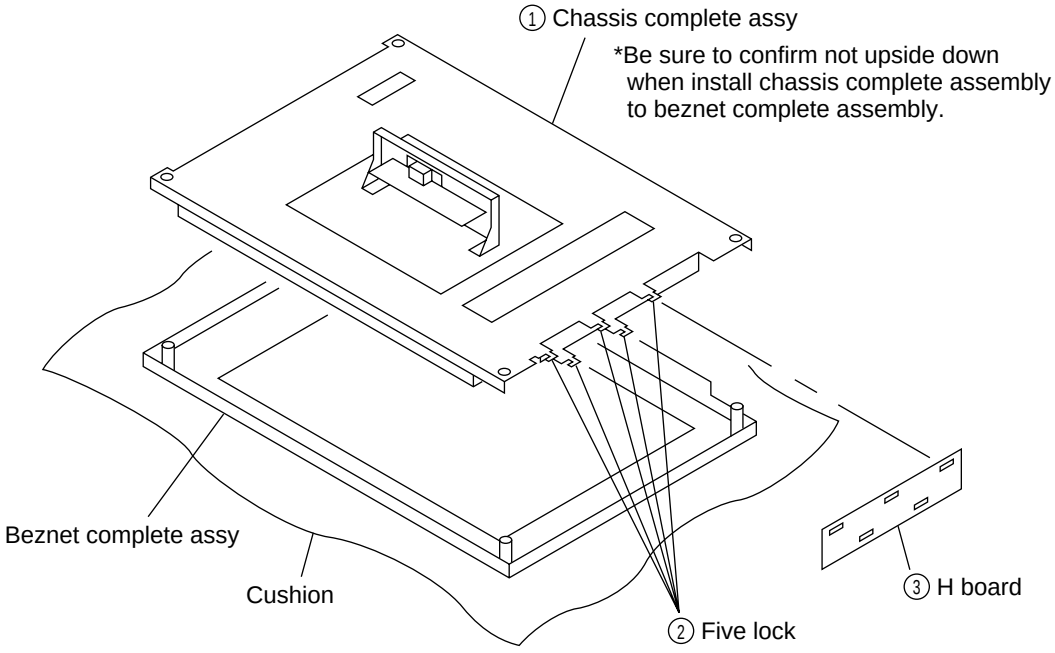
2-2. CABINET COMPLETE ASSY REMOVAL



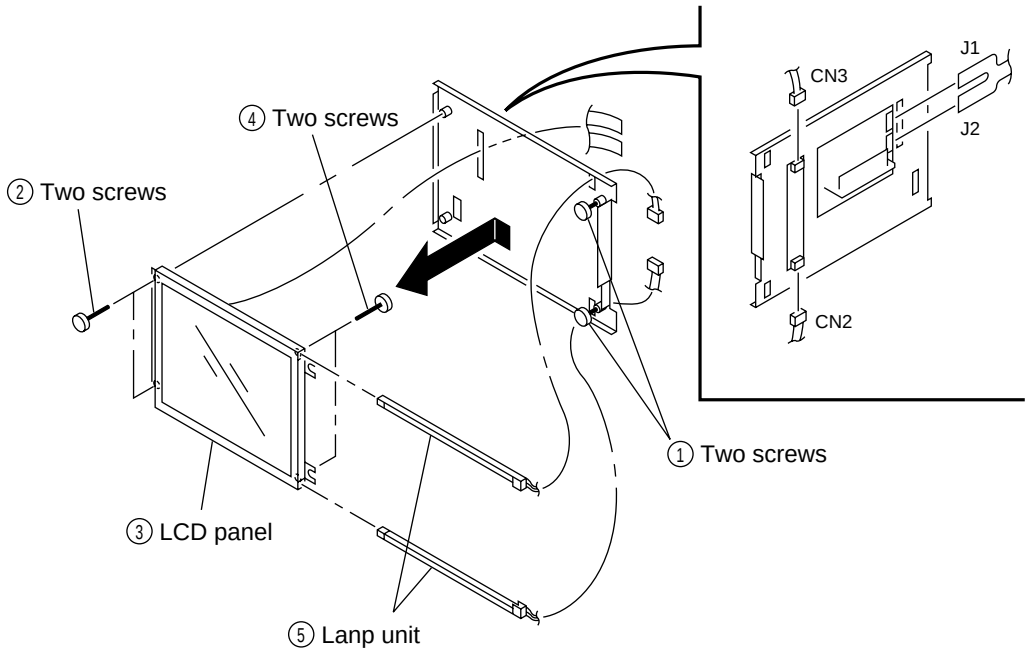
2-3. A BOARD, J BOARD AND INVERTER REMOVAL



2-4. H BOARD REMOVAL



2-5. LCD PANEL AND LAMP UNIT REMOVAL



SECTION 3
ADJUSTMENTS

This paper documents the functional alignment (color and geometry) procedure of Sony flat panel monitor CPD-M151.

- **Equipment**

Computer:	PC workstation with Wndows 95 installed PS/2 mouse is required
Software:	Capetronic engineering alignment software tool
Color meter:	Option
Signal generator:	Option
Cable:	Special RS232 interface cable

- **Setup**

1. Copy Capetronic software <ALIGN.EXE> into a new PC directory.
2. Prepare timing and pattern data for signal generator according to Sony's timing specifications.
3. Prepare timing files for <ALIGN.EXE>.
4. Connect monitor interface cable between flat panel monitor and PC com port.
5. Connect monitor video cable to signal generator.
6. Put Topcon 50cm from the this monitor; Point it perpendicularly at the center of the display; Achieve the best focus throught the eyepiece.
7. Enclose the this monitor and Topcon in a light-shield chamber.

- **Download**

In order to enhance productivity, a software utility is provided to download default data to LCD monitor. The default data includes color balance data and geometry timing data.

- **Operation**

1. Execute software <ALIGN.EXE>.
2. Click on 'Setup' menu.
3. Select 'Monitor' type as 'Sony CPD-M151'.
4. Select 'COM PORT' according to hardware connection.
5. Click <OK> to save the new setup configuration.
6. Quit this application and Re-enter to make the new settings effective.

- **On Screen Adjustment**

1. Click on the 'Monitor' icon; an virtual monitor panel would show up.
2. On entry, the software tires to establish a communication link with the monitor. The monitor internal DACs are read and shown on screen sliders. A 'CONNECT' icon would show up on the lower left corner of the dialog screen.
3. An error message would pop up should communication fail. A 'BREAK' icon would show up on the dialog screen. If this happens, check the hardware setup, communication cable, and the connection.

- **Warm up time**

Allow 30 minutes warm up time before doing any adjustment.

- **Color Adjustment**

1. 9300K color adjustment
   --Center adjustment--
   a. Click 'Color Temperature' as '9300'.
   b. Apply 30% IRE white video field, primary mode.
   c. Make sure 'backlight' register data is 0 (100%).
   d. Click 'Apply Default' (inside color register box). Refer to table 1 for default data for color adjustment.
   e. Adjust 'sub_brt_R' and 'sub_brt_B' to achieve color temperature. Refer to table 2 for specifications.
   f. Apply 100% IRE white video field.
   g. Adjust 'Contrast' to achieve 'nominal' luminance (refer to spec).
   h. Click 'Set AS Center' for a 9300K color save.
   i. Apply 100% IRE white video.

   --Contrast Max adjustment--
   j. Increase 'Contrast' to Contrast_Max from default data table 1.
   k. Click 'Set As Contrast Max'.

   --Contrast Min adjustment--
   l. Decrease 'Contrast' to achieve 'low' luminance (refer to default data table 1).
   m. Click 'Set As Contrast Min'.

   --Brightness Max adjustment--
   n. Increase 'Brightness' to maximum achievable (refer to default data table 1).
   o. Click 'Set As Bright Max.'

   --Brightness Min adjustment--
   p. Decrease 'Brightness' to Bright_Min from default data table 1.
   q. Click 'Set As Bright Min'.
   r. Click 'Save this color' to save the color alignment data to the monitor.

2. 5000K color adjustment
   a. Click 'Color Temperature' as '5000'
   b. Repeat alignment procedure as 9300 steps b - r.

3. 6500K color adjustment
   a. Click 'Color Temperature' as '6500'
   b. Repeat alignment procedure as 9300 steps b - r.

Table 1: Default data for color adjustment

Color	9300K			6500K			5000K		
Condition	Min	Center	Max	Min	Center	Max	Min	Center	Max
Brightness (G)	50	128	255	50	128	255	50	128	255
Contrast (G)	20	53	70	20	53	70	20	53	70
Sub-Brt-R	NA	120	NA	NA	132	NA	NA	135	NA
Sub-Brt-B	NA	126	NA	NA	113	NA	NA	85	NA
Sub-Cont-R	NA	53	NA	NA	53	NA	NA	53	NA
Sub-Cont-B	NA	53	NA	NA	53	NA	NA	53	NA

Table 2: Specifications for Color adjustment

Color	x	y	Y (40% IRE)
9300	283	298	10
6500	314	328	10
5000	345	358	10
Tole	10	10	3

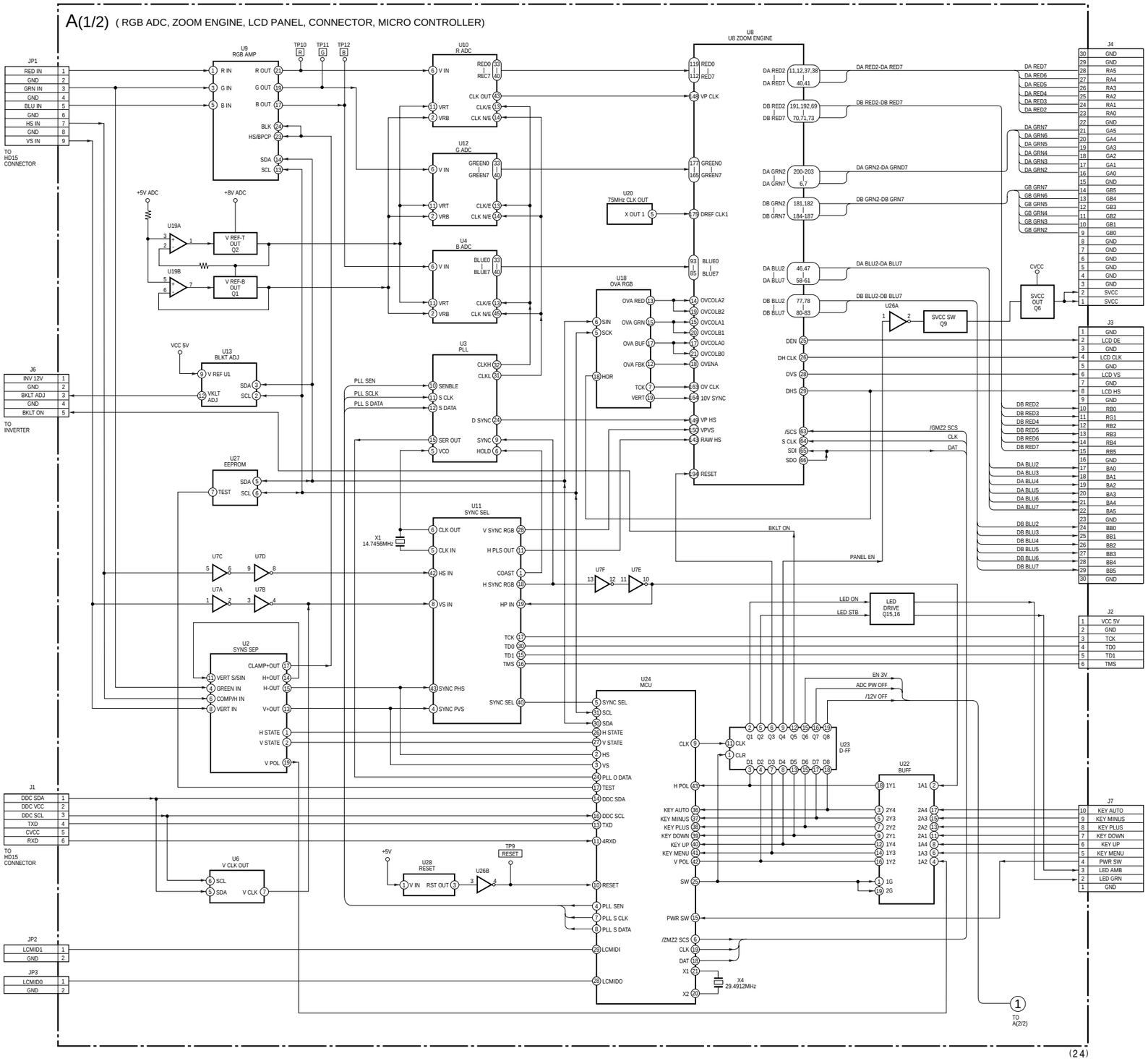
All luminance measurements are in cd/m^2

- **Geometry Adjustment**

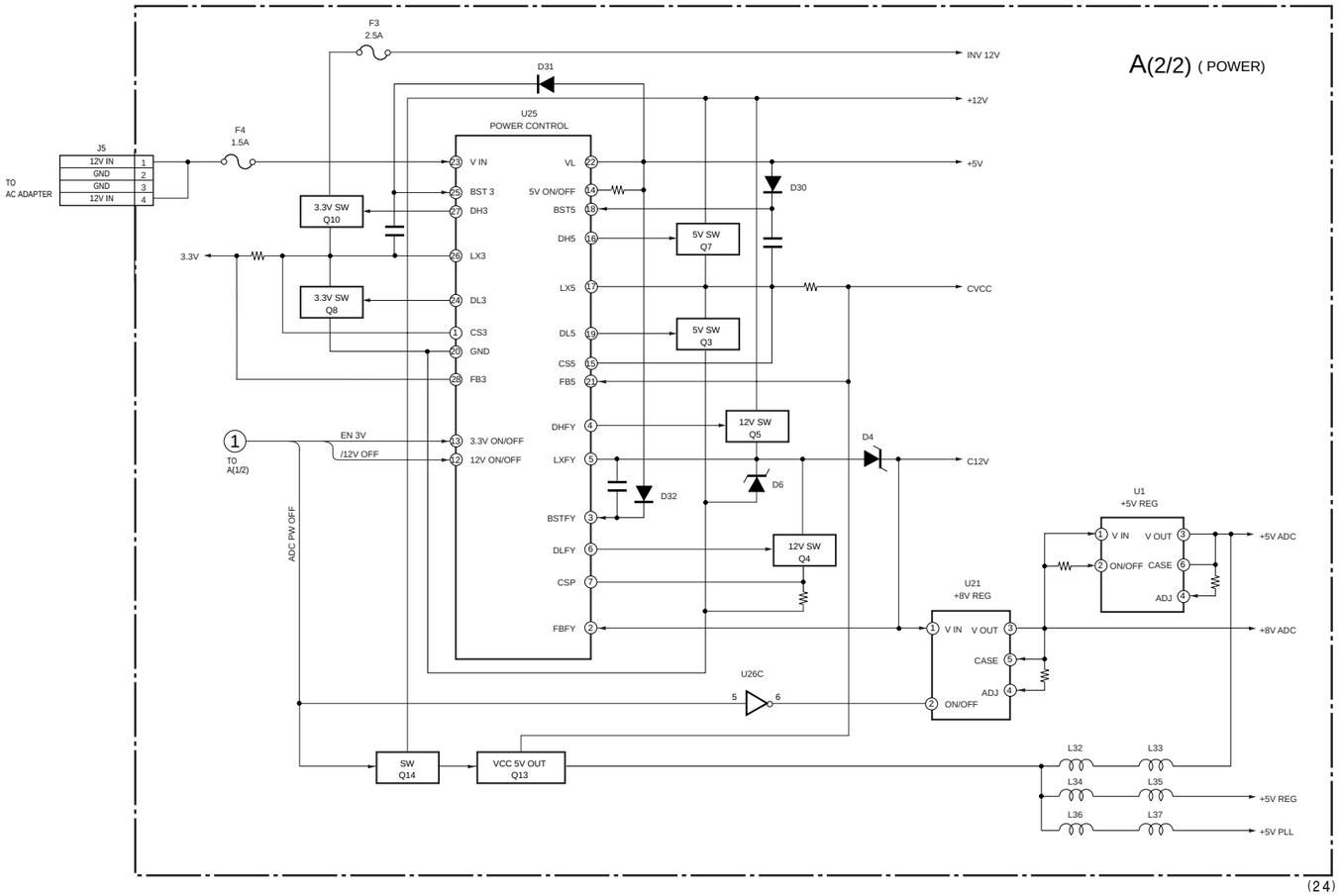
1. Connect the personal computer which has alignment data.
2. Click 'Apply Default' (inside Geometry Register Box).
3. Adjust 'Pitch' for optinum screen performance.
4. Adjust 'Phase' for optinum screen performance.
5. Adjust 'H position' to make the screen center horizontally.
6. Adjust 'V position' to make the screen center vertically.
7. Repeat steps 3-6 for best pictre performance.
8. Click 'Save to UMT' to perform a user timing mode save.
9. Repeat step 1-7 for each of the user preset timings.

SECTION 4
DIAGRAMS

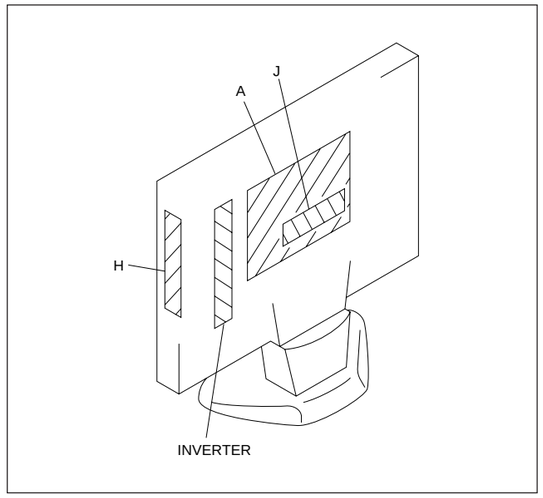
4-1. BLOCK DIAGRAMS



(24)



4-2. CIRCUIT BOARDS LOCATION



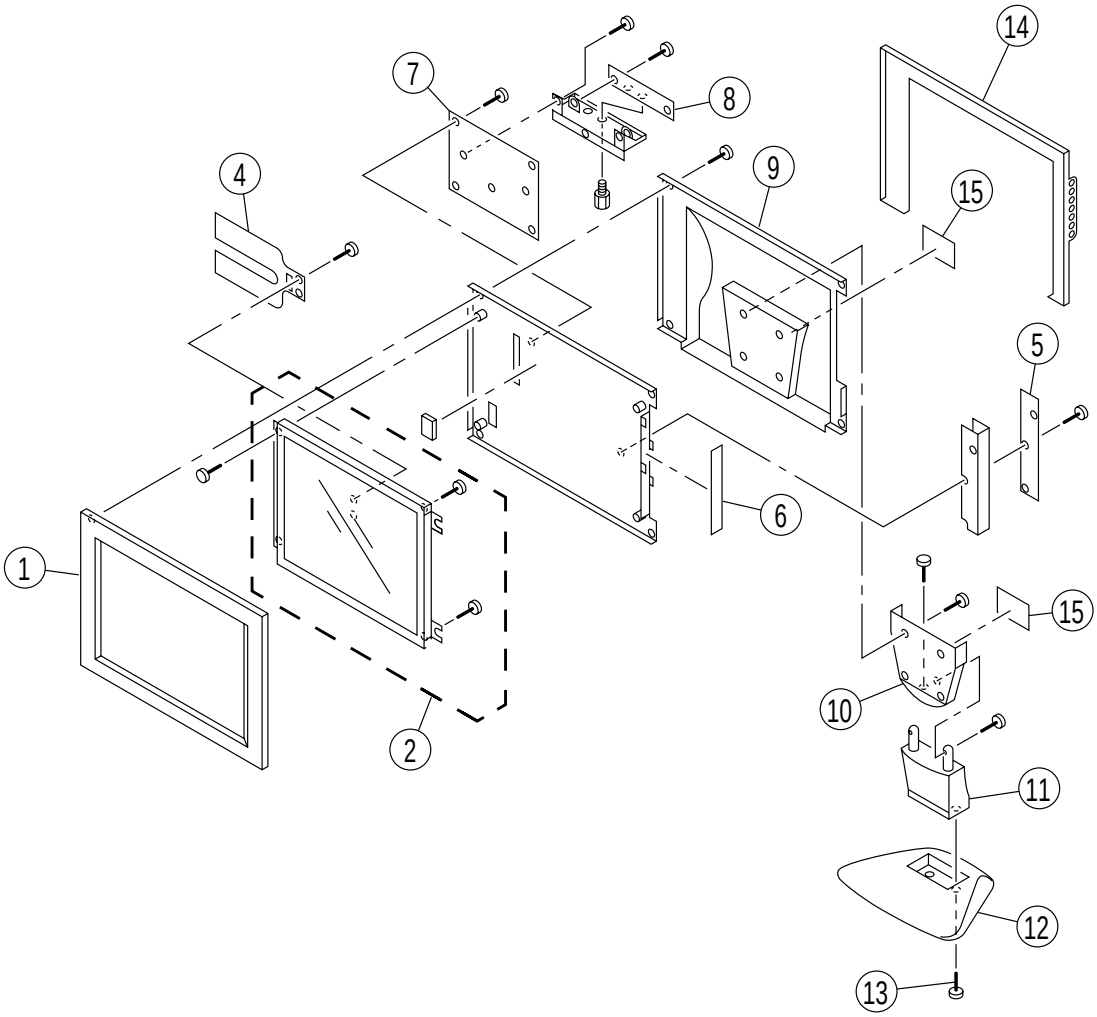
SECTION 5
EXPLODED VIEWS

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

5-1. CHASSIS

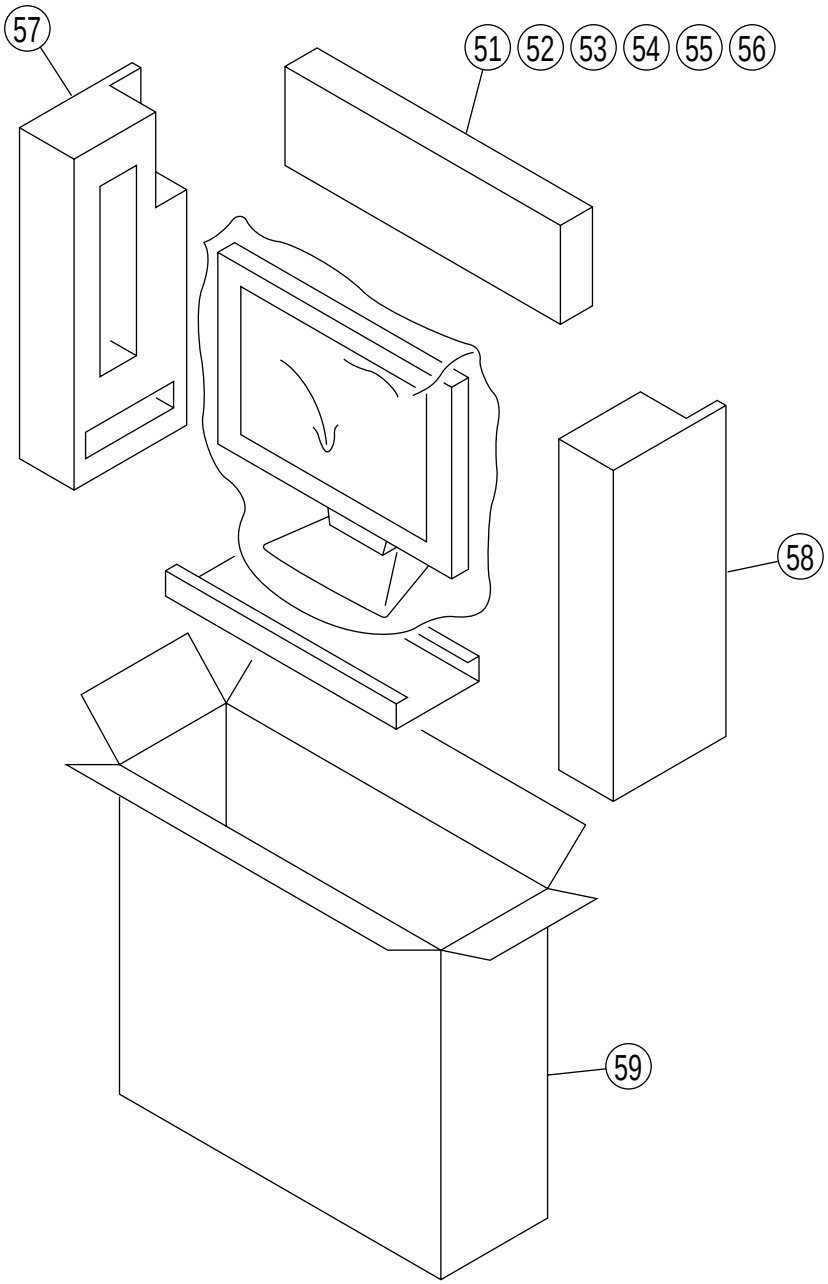


REF.NO.	PART NO.	DESCRIPTION	REMARK
1	A-1017-121-A	BEZNET COMPLETE ASSY (WHT)	
#1 1	A-1017-226-A	BEZNET COMPLETE ASSY (BLK)	
2	1-803-808-11	PANEL, LCD	
#2 3	~~1-418-666-11~~	~~LAMP UNIT~~	
#3 4	~~1-791-629-11~~	CABLE, FLAT	
5	1-418-667-11	INVERTER	
6	* A-1372-710-A	H BOARD, COMPLETE	
7	* A-1294-845-A	A BOARD, COMPLETE	
8	* A-1388-265-A	J BOARD, COMPLETE	
9	A-1006-568-A	CABINET COMPLETE ASSY (WHT)	
#1 9	A-1006-583-A	CABINET COMPLETE ASSY (BLK)	
10	A-1501-544-A	STAND ASSY, PHOTO (WHT)	
#1 10	A-1501-729-A	STAND ASSY, PHOTO (BLK)	
11	X-4037-131-1	ARM ASSY (WHT)	
#1 11	X-4037-978-1	ARM ASSY (BLK)	
12	X-4037-132-1	STAND BASE ASSY (WHT)	
#1 12	X-4037-979-1	STAND BASE ASSY (BLK)	
13	4-072-609-01	SCREW M4X10mm	
14	A-1005-364-A	COVER ASSY, BACK (WHT)	
#1 14	A-1005-385-A	COVER ASSY, BACK (BLK)	
15	* 4-073-940-01	LABEL, INFORMATION (WHT)	[Made in Taiwan]
#4 15	* 4-073-940-21	LABEL, INFORMATION (WHT)	[Made in Thailand]
#1 15	* 4-073-940-11	LABEL, INFORMATION (BLK)	

5-2. PACKING MATERIALS

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



REF.NO.	PART NO.	DESCRIPTION	REMARK
51	1-785-512-31	CONNECTOR, D SUB (15P CHANGER)	
#5 52	⚠ 1-477-232-21	ADAPTOR, AC	
53	1-759-626-13	DISK, UTILITY (※)	
54	1-791-628-11	CABLE, RGB	
55	A-1501-545-A	COVER ASSY, STAND (WHT)	
#1 55	A-1501-730-A	COVER ASSY, STAND (BLK)	
56	3-867-552-21	MANUAL, INSTRUCTION (WHT)	
#1 56	3-867-552-31	MANUAL, INSTRUCTION (BLK)	
57	4-071-633-01	CUSHION (LEFT)	
58	4-071-634-01	CUSHION (RIGHT)	
59	* 4-073-804-01	INDIVIDUAL CARTON (WHT)	
#1 59	* 4-077-561-01	INDIVIDUAL CARTON (BLK)	

※ Supply two discs for macintosh and windows by the reason of the package.

Sony Corporation
Computer Display Division Company
Computer Display Div.

English
2004BL24253-1
Printed in Japan
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CPD-M151
9-978-665-03 2004BL24253-1